GE Toshiba Automation Systems

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9/22/ 2003

To: Mr. John Larsen
Intermountain Power Service Corp.
850 W. Brush Wellman Rd.
Delta, UT 84624-9546

Subject: LCI Drive System
Reference: Intermountain Power ID Fan Upgrade
GE Proposal #: DSP090832 rev.1

Thank you for your inquiry for a GE Innovation Series™ Medium Voltage LCI Drive. The Innovation Series™ Medium Voltage LCI family represents the premier LCI Synchronous Motor systems available in the world!

GE Toshiba Automation Systems proposes to furnish the electric equipment as outlined in this specification for the Intermountain Power ID Fan Upgrade. The scope of supply of this proposal shall be for new Innovation Series LCI drives. **In this revision, we plan to retain the existing LCI transformers, DC link reactors, and the existing motor. We are supplying two 6x6 pulse Converter Channels per drive.** The new system will have a capacity of 8,500HP and will be adjusted to run the existing motor to its full capacity. When, and if, a future up-rate to 10,000HP or more is done, the existing motor, transformers, and link reactors will have to be replaced but the new LCI will be fine. As an option, we have provided a price for a new transformer that can be used to replace the existing transformers if their integrity is in question.

Advantages:

Extended Motor Life

With the LCI, the motor is always under drive control. No locked rotor starting currents, excessive temperatures or mechanical stresses are ever put on the motor. This contrasts with constant speed motors in which the driven equipment is subjected to hard starts and the heat caused by the starting current degrades the motor insulation and shortens life.

Bus Voltage Variation Resistant

The LCI motor is somewhat buffered from the power bus so that it is less sensitive to voltage fluctuation. If there is a momentary dip in voltage the LCI will continue to produce torque or coast (depending on the magnitude of the dip) until voltage is returned, and then re-accelerate to desired speed. The LCI motor will not pull out of step like a fixed speed motor, but will continue to operate.

SCR Replacement is Simple

If an SCR has to be replaced, it is simply a matter of releasing the pressure on the cells by adjusting two torque nuts. The SCR can then simply be slipped out of the rack and replaced (a spreader tool is provided to simplify the replacement). There is no plumbing to be disconnected.

Less Weight, Less Maintenance

Unlike a constant speed drive with complex reduction gears or a massive bull gear for speed reduction, the LCI is gearless, and draws only the power necessary to achieve the required output. The result is a significant increase in efficiency, and a major decrease in required maintenance. And, because there are no gears, there are fewer mechanical parts to wear out or be maintained.

GE's Six Sigma processes, combined with decreased manufacturing variability and demand flow technology, enables us to meet the **Highest Standards Of Product Quality**!

Drive System:

Qty 1- LCI Drive System rated 8,500 HP and adjusted to power existing motor to its approved maximum. Drive is liquid cooled using included indoor water to water heat exchangers.

Each Drive System Includes:

- Dual 4 Kv Control Power Converter Channels (6x6 pulse)
- Two Water to Water Heat Exchangers
- Two GE Limitamp Output Contactors
- GE Multilin PQM meter

Total Net Price for One System Delivered in 2004: ..... **$ 589,820.00**

Optional New Isolation Transformer:
(primary shifted 7.5 degree), dry, 4.2 MVA, 6900V/4000V ..... **$ 73,100.00**
(We can provide an additional discount if multiple transformers are purchased.)

Total Net Price for Two Systems Delivered in 2005: ..... **$ 1,202,620.00**

Total Net Price for Three Systems Delivered in 2006: ..... **$ 1,850,430.00**

Total Net Price for Two Systems Delivered in 2007: ..... **$ 1,262,820.00**

Shipping is not included in the above prices and is estimated to be $15K/ Drive system.

Fifteen days of Start-up time and 1 Round Trip per Drive System is included in the above prices but we believe only six days will be required.

Optional Adders & Other Items

Description	Quantity	Price ($000 USD)
Analysis		
Torsional Analysis (per system)	1	29,000
Special Test		
VFD Witness Test (per system)	1	2,500
Transformer Heat Run Witness Test (per system)	1	3,000
Transformer BIL Witness Test (per system)	1	3,000
Transformer Corona Witness Test (per system)	1	3,000
Transformer Noise Witness Test (per system)	1	2,000
Transformer EMI Witness Test (per system)	1	3,500
Training		
Customer Site training course for up to 15 IPSC personnel.	1	14,300
Four day training Course in Salem, VA facility. (travel and living not included)	per person	2,250
Spare Parts		
LCI Spares Kit	1 set	69,600

COMMENTS TO CUSTOMER RFQ / SPECIFICATIONS

For specific comments and clarifications relative to your RFQ / Specification, see additional information included in the separate APPLICATION AND COMMENTS document. This document provides an engineering analysis and areas of benefit and savings.

Commercial Terms and Conditions

Commercial Terms:	GE Standard Terms & Conditions, GTA-1020
Bid Validity:	45 days
Payment terms:	**10% upon submittal of drawings, 40% upon completion of factory tests, 40 % upon shipment of equipment, and 10% upon completion of start-up but not to exceed 60 days from date of shipment.**
Warranty:	Lesser of 18 months from shipment or 12 months from operation.
Delivery (est.):	First drive can be supplied by mid Feb. 2004. This shipment is dependent on receipt of an order by early October, 2003 and excluding special testing requirements.
Title:	Title to the goods shall pass from seller to buyer when the goods are packed and ready to ship at seller's factory (including seller's vendor for buy/sell items).
Freight:	Not included.

We hope you find this quotation meets your needs. Should you have any questions or comments, please do not hesitate to call me. Additional product description information is available upon request.

Comments & Clarifications — Sept. 8, 2003
Customer: Intermountain Power — GTAU Prop: DSP090832
RFQ Reference: Spec. 45605 Part F – Division F7

Section	Comment
2.f	Outdoor Power Factor correction capacitors has **NOT been** included to provide this requirement. The price for these would be approx. $ 63,250.00 but it would be better to apply correction at the system level, which I believe is the new plan of attack.
4.b	Failed Switch Bypass – please see attached technical paper, in Word, on advantages of GE Innovation Series LCI of this application, LCI N+1 Redundancy.
5.a	The Innovation Series LCI will require rear access for cable connections.
5.b	All power components are mounted in on swing out doors or in such a way to insure ease of access and repair. See attached picture of SCR change-out in document DSP090832_LCI Service Access.
6.d	The Innovation Series LCI does not use 'quick disconnect fitting' in the water cooling system as these are a weak link in reliability. Instead, the drive is designed to allow servicing the drive without breaking any water connections.
6.h	The Innovation Series LCI doors are suitable for pad-locking as mechanical door interlock protection. If a system like 'Kirk key' interlocks are required, these interlocks are best added at site so that the correct equipment is coordinated.
10	GE Limitamp drive output contactors have been included.
11	The drive will be given the standard factory test procedures as will the transformers. Since the total system, drive, transformer, reactors, and motor will not come together until at site, no integrated factory test will be performed.
13	Onsite Training is available and one version of this is quoted above.